CTDOT MS4 Program

DOT District 1, Capital Region COG – April 23, 2019
DOT District 2, Southeast COG – April 4, 2019
DOT District 3, Metro COG – June 5, 2019
DOT District 4, Naugatuck Valley COG – May 14, 2019
CT DOT HQ, Newington, CT – May 20, 2019
CT DOT MS4 Program
Objectives

• Review Non-Point Source Pollution and MS4 Programs
• Compare DOT & Municipal MS4 Permits
• Explain DOT’s Plan to improve runoff from State roads
• Describe the opportunities for DOT & Municipal data sharing
• Inform on how to Comment on DOT’s Stormwater Management Plan
Agenda

• **CTDOT MS4 Team**

• MS4 Basics & DOT Permit Development

• DOT MS4 Permit Overview

• DOT’s Stormwater Management Plan

• Impaired Waters & USGS Water Quality Model
CT DOT MS4 Team

Bureau of Engineering and Construction
Office of Engineering
Environmental Compliance

Adam Fox P.E.
Transportation Principal Engineer

Jason Coite P.E.

Daniel Imig P.E.

Bureau of Policy and Planning
Office of Environmental Planning

Kim Lesay
Assistant Planning Director

Kevin Carifa

Jeremy Willcox

MS4 Team Email: DOT.MS4@ct.gov
Agenda

• CTDOT MS4 Team

• **MS4 Basics & DOT Permit Development**

• DOT MS4 Permit Overview

• DOT’s Stormwater Management Plan

• Impaired Waters & USGS Water Quality Model
MS4 Basics

MS4

• Municipal Separate Storm Sewer System
  o A publicly owned stormwater runoff conveyance system
  o Discharges to the waters of the U.S.

NPDES

• National Pollutant Discharge Elimination System
  o Permits issued by EPA or authorized states
MS4 Basics

1972
- Clean Water Act
- NPDES developed to address point source pollution
- Sewage Treatment Plants and Industrial Wastewater

1990
- EPA regulates MS4 Phase I
- NPDES expanded to address non-point source pollution
- Towns/Cities with populations >100,000

1999
- MS4 Phase II
- Towns/Cities with populations <100,000 (Small MS4’s)
- Non-Traditional MS4s

2004
- CT DEEP issued Small MS4 General Permit
- 113 Towns/Cities
2016 • Draft DOT MS4 General Permit published for public comment

May 2018 • CT DEEP issues Final DOT MS4 General Permit

April 1 2019 • DOT Stormwater Management Plan published for public comment (Available here: www.ct.gov/dot/ctdot-ms4)

July 2019 • Effective Date for the DOT MS4 General Permit
Examples of Non-Point Source Pollution

- Septic Systems
- Fertilizers
- Erosion
- Grass / Leaves
- Pet Waste
- Motor Oil
- Trash
- Detergents
CTDOT is considered as a non-traditional municipality

- The DOT MS4 permit
  - Based on the Small MS4 General Permit
  - A General Permit for one permittee
DOT Maintained Assets Include:
- 3,719 Centerline Miles
  - Approximately 9,800 Lane Miles
- 4,016 Bridges
- 180 Commuter Parking Lots
- 15 Rest Areas and Service Plazas
- Over 250 Miles of Railroad ROW
- 4 Rail Facilities

Other DOT facilities covered under Commercial or Industrial Stormwater General Permits
DOT’s financial constraints are similar to many municipalities...relative to scale

As a new regulatory requirement, DOT requested MS4 funding from the State Legislature

No funding for FY2019

Funding for FY2020 TBD
Agenda

• CTDOT MS4 Team
• MS4 Basics & DOT Permit Development
• **DOT MS4 Permit Overview**
• DOT’s Stormwater Management Plan
• Impaired Waters & USGS Water Quality Model
**DOT MS4 Permit Overview**

- Six Minimum Control Measures (MCMs)
  1. Public Outreach & Education
  2. Public Involvement / Participation
  3. Illicit Discharge Detection & Elimination
  4. Construction Site Stormwater Runoff Control
  5. **Post Construction Stormwater Management**
  6. Pollution Prevention / Good Housekeeping
- Plus, outfall monitoring requirements

Comparing the CT Municipal and DOT MS4 Permits

- Four of the six Minimum Control Measures are substantially unchanged from the Municipal Permit
  - MCM 1 – Public Outreach & Education
  - MCM 2 – Public Involvement/Participation
  - MCM 4 – Construction Storm-water Runoff Control
  - **MCM 6 – Good Housekeeping/Pollution Prevention**
Comparing the CT Municipal and DOT MS4 Permits

• Two Minimum Control Measures have many similarities but with notable differences
  o MCM 3 – Illicit Discharge Detection and Elimination
  o MCM 5 – Post-Construction Stormwater Management
Comparing the CT Municipal and DOT MS4 Permits

- 121 municipalities are regulated under the Small MS4 General Permit
- 113 municipalities since 2004

Comparing the CT Municipal and DOT MS4 Permits

<table>
<thead>
<tr>
<th>Permit Term</th>
<th>Municipalities</th>
<th>DOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1, 2017 to June 30, 2022</td>
<td></td>
<td>July 1, 2019 to</td>
</tr>
<tr>
<td>June 30, 2022</td>
<td></td>
<td>June 30, 2024</td>
</tr>
</tbody>
</table>
Comparing the CT Municipal and DOT MS4 Permits

- **Legal Authority**
  - DOT lacks authority to regulate land use and development

- **Mapping Deadlines**
  - Extends other permit requirements that are reliant on mapping

- **Impaired Waters Outfall Monitoring**
  - Continuous sampling at limited number of sites
  - Computer modeling impacts of roadway drainage
**MS4 Priority Areas**

- **Urban Areas**
- Areas that Discharge to Impaired Waters
- Areas with Greater than 11% DCIA

**Directly Connected Impervious Area**

[Image: Retrieved from UCONN NEMO “What Type of Impervious Cover do you Have?”](https://nemo.uconn.edu/ic-guide/step2-type.htm)

**Disconnected Impervious Area**

[Image: Retrieved from UCONN NEMO “What Type of Impervious Cover do you Have?”](https://nemo.uconn.edu/ic-guide/step2-type.htm)
Agenda

• CTDOT MS4 Team
• MS4 Basics & DOT Permit Development
• DOT MS4 Permit Overview
• **DOT’s Stormwater Management Plan**
• Impaired Waters & USGS Water Quality Model
DOT’s Stormwater Management Plan

SWMP

• DOT’s plan on implementing its MS4 Program
• Lists the best practices to be implemented to meet permit requirements
• Plan can be found here: www.ct.gov/dot/ctdot-ms4
• Comments on the plan can be sent to: DOT.MS4@ct.gov
• Comment deadline is 6/30/19
# MCM 1 – Public Outreach & Education

<table>
<thead>
<tr>
<th>BMP ID</th>
<th>Deadline</th>
<th>Activity</th>
<th>Responsible Position</th>
<th>Measurable Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM1.1</td>
<td>June 30, 2021</td>
<td>Implement a Public Education Program</td>
<td>Bureau Chief of Policy &amp; Planning</td>
<td>Program(s) developed and implemented</td>
</tr>
<tr>
<td>MCM1.2</td>
<td>June 30, 2021</td>
<td>Distribute non-point source educational materials at DOT public meetings</td>
<td>Bureau Chief of Policy &amp; Planning</td>
<td>Track meetings where materials are distributed</td>
</tr>
<tr>
<td>MCM1.3</td>
<td>June 30, 2021</td>
<td>Develop Dedicated MS4 Webpage on DOT Website</td>
<td>Bureau Chief of Policy &amp; Planning</td>
<td></td>
</tr>
</tbody>
</table>
Information on CTDOT’s MS4 Program

www.ct.gov/dot/ctdot-ms4
Public notice to be provided in multiple ways including:

- Posting on www.ct.gov/dot/ctdot-ms4
- Sending notification to MS4 listserv
  - Go to: https://nemo.uconn.edu/ms4/ (Link at bottom of the page)
## MCM 3 – IDDE

<table>
<thead>
<tr>
<th>BMP ID</th>
<th>Deadline</th>
<th>Activity</th>
<th>Responsible Position(s)</th>
<th>Measurable Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM3.6</td>
<td>June 30, 2024</td>
<td>Identify and map 50% of DOT’s MS4 System in Priority Areas</td>
<td>Bureau Chief(s) – Engineering and Construction, Policy &amp; Planning, Maintenance, Public Transit</td>
<td>50% of Mapping Completed</td>
</tr>
<tr>
<td>MCM3.7</td>
<td>June 30, 2024</td>
<td>Screen and sample all mapped outfalls and key interconnection points</td>
<td>Environmental Compliance</td>
<td>Completion of screenings and/or samplings for mapped outfalls and interconnections</td>
</tr>
<tr>
<td>MCM3.8</td>
<td>June 30, 2021 &amp; Annually</td>
<td>Provide annual IDDE training to employees</td>
<td>Bureau Chief(s) – Engineering and Construction, Policy and Planning, Maintenance, Public Transit</td>
<td>Trainings completed</td>
</tr>
</tbody>
</table>
Mapping DOT’s Stormwater System

- Starting from scratch
- Mapping Standardization
  - COG’s GIS Standards Committee
  - DOT schema will be the basis of the State Standard
- Long-term: Sharing MS4 interconnection data with municipalities
### MCM 4 – Construction Stormwater

<table>
<thead>
<tr>
<th>BMP ID</th>
<th>Deadline</th>
<th>Activity</th>
<th>Responsible Position(s)</th>
<th>Measurable Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM4.3</td>
<td>July 1, 2019</td>
<td>Develop and implement a plan outlining how all DOT Offices with jurisdiction over land disturbance and development projects will coordinate their functions</td>
<td>Bureau Chief - Engineering &amp; Construction</td>
<td>Plan development and implementation</td>
</tr>
<tr>
<td>MCM4.4</td>
<td>July 1, 2019</td>
<td>Conduct a site plan review or confirm that a site plan review was completed by <a href="#">the appropriate authority</a></td>
<td>Bureau Chief - Engineering &amp; Construction</td>
<td>Standard practice established to verify reviews are completed</td>
</tr>
</tbody>
</table>

[the appropriate authority](#)
# MCM 5 – Post-Construction Stormwater

<table>
<thead>
<tr>
<th>BMP ID</th>
<th>Task Deadline</th>
<th>Activity</th>
<th>Responsible Position(s)</th>
<th>Measurable Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM5.3</td>
<td>June 30, 2022</td>
<td>Implement runoff reduction for DOT development and redevelopment projects</td>
<td>Bureau Chief(s) – Policy &amp; Planning, Engineering &amp; Construction</td>
<td>Documented runoff reduction/LID implementation for DOT projects</td>
</tr>
<tr>
<td>MCM5.4</td>
<td>June 30, 2024</td>
<td>Calculate DCIA for DOT’s MS4 catchment areas (those that have been mapped for MCM3 - IDDE)</td>
<td>Bureau Chief - Engineering &amp; Construction</td>
<td>Report %-DCIA for DOT’s mapped catchment areas</td>
</tr>
<tr>
<td>MCM5.5</td>
<td>June 30, 2022</td>
<td>Implement a plan to ensure long term maintenance of stormwater management facilities</td>
<td>Bureau Chief(s) – Maintenance, Engineering &amp; Construction</td>
<td>Plan development and implementation</td>
</tr>
</tbody>
</table>
Examples of Stormwater BMPs

Vegetated Swale

Rain Gardens and Pervious Pavers
Photo of rain gardens and pervious pavers along Main Street, Bridgeport, CT. National Low Impact Developed (LID) Atlas Retrieved from: http://lidmap.uconn.edu/
Examples of Stormwater BMPs

Bioretention System

Bioswales
Examples of Stormwater BMPs

Enhanced Dry Swale

Post-Construction Wet Pond
DCIA – Mapping, Tracking & Reductions

Map the storm sewer system
- Required for IDDE
- Half the system must be mapped within 5 years
- Map the rest within 10 years

Determine the amount of DCIA
- Only for those areas that have been mapped
- DOT-owned DCIA
- Non-DOT owned DCIA counts towards the Municipal MS4’s DCIA total

Track changes in DCIA
- DOT projects that incorporate runoff reduction, infiltration, or stormwater retention
- DOT projects that add impervious cover
- Long-term: standalone retrofit BMP projects

Reduce DCIA by 2%
- Benchmarked against only that which has been mapped
- Same target reduction as Small MS4 General Permit

CT DOT MS4 Program
## MCM 6 – Good Housekeeping / Pollution Prevention

<table>
<thead>
<tr>
<th>BMP ID</th>
<th>Task Deadline</th>
<th>Activity</th>
<th>Responsible Position(s)</th>
<th>Measurable Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM6.6</td>
<td>July 1, 2019</td>
<td>Develop and implement sweeping program</td>
<td>Bureau Chief Maintenance</td>
<td>Sweeping activities documented and reported</td>
</tr>
<tr>
<td>MCM6.7</td>
<td>July 1, 2019</td>
<td>Develop plan to optimize catch basin cleaning</td>
<td>Bureau Chief Maintenance</td>
<td>Plan developed</td>
</tr>
<tr>
<td>MCM6.8</td>
<td>July 1, 2022</td>
<td>Inspect and clean (where necessary) catch basins</td>
<td>Bureau Chief Maintenance</td>
<td>Catch basins mapped, inspected and prioritized</td>
</tr>
</tbody>
</table>

CT DOT MS4 Program
Street Sweeping

- CTDOT has an existing street-sweeping program
- Developing a GIS-application will improve efficiency
  - Track progress
  - Prioritize problem areas

- CTDOT has limited number of street sweepers
- FY19 and FY20 funding requests for additional street sweepers not approved
• CTDOT has an existing catch-basin cleaning program

• Developing a GIS-application will improve efficiency
  o Track progress
  o Prioritize problem catchments
  o Mapping drainage system

• CTDOT has limited number of vacuum trucks

• Request for funding for additional vacuum trucks not approved for FY19 or FY20
• CTDOT MS4 Team
• MS4 Basics & DOT Permit Development
• DOT MS4 Permit Overview
• DOT’s Stormwater Management Plan
• **Impaired Waters & USGS Water Quality Model**
USGS will monitor 9 representative outfalls

- Locations were selected based on land use, impervious area, and traffic
- 2 years of continuous monitoring for each outfall

Parameters:
- precipitation
- snow depth
- air temperature
- water temperature
- flow
- conductance
• In addition, each outfall sampled 15 to 18 times
  o 18 constituents in the Small Municipality MS4 permit
  o Plus 26 additional analytes
• Sampling results will be added to FHWA stormwater runoff database
• Monitoring and sampling results to be used in USGS’s model for predicting roadway impacts to water quality
S.E.L.D.M.

- **Stochastic Empirical Loading Dilution Model**

- **Highway Runoff Quality Model**
  - Developed by USGS with the FHWA
  - Utilized by other DOTs
    - Washington
    - Oregon
    - Colorado
    - Massachusetts

Figure 1 – S.E.L.D.M. Opening form. Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0. Appendix 4. Navigating the Graphical User Interface. U.S. Geological Survey Techniques and Methods 4–C3. Retrieved from [https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_SOB_files/tm4-C3_apdx4_v030813.pdf](https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_SOB_files/tm4-C3_apdx4_v030813.pdf)

Figure 2 – Highway runoff quality—Data structure, tables, fields, and relationships. Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0—Appendix 3. Selected relational diagrams showing the structure of the database. U.S. Geological Survey Techniques and Methods 4–C3. Retrieved from [https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_SOB_files/tm4-C3_apdx3_plate_v022513.pdf](https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_SOB_files/tm4-C3_apdx3_plate_v022513.pdf)

Figure 3 – Downstream water quality—Data structure, tables, fields, and relationships. Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0—Appendix 3. Selected relational diagrams showing the structure of the database. U.S. Geological Survey Techniques and Methods 4–C3. Retrieved from [https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_SOB_files/tm4-C3_apdx3_plate_v022513.pdf](https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_SOB_files/tm4-C3_apdx3_plate_v022513.pdf)
SELDM: How will it be used?

• SELDM to be run on all mapped outfalls by the end of the permit term
  o Schedule tied to mapping

• Evaluate DOT’s impact on a receiving waterbodies

• Model results will be used as basis for follow up investigations and implementation of BMPs

• Model will be used to develop Retrofit Program
• Stormwater Management Plan can be found here: www.ct.gov/dot/ctdot-ms4

• Comments on the plan can be sent to: DOT.MS4@ct.gov

• Comment period ends June 30, 2019
Questions?

DOT.MS4@ct.gov